



### Guest Editorial

#### Robert Schurko, Windsor

*Some reflections on NMR at the University of Windsor, 2008-2009*

August 2008 saw the retirement of our longtime

NMR manager **Mike Fuerth**, who had been in charge of NMR spectrometers and other various instruments since 1972. Mike stayed on to overlap with our new NMR manager, **Matt Revington**, and help him get settled in. Matt, who is originally from Windsor, completed his Ph.D. at the University of Western Ontario under the supervision of **Gary Shaw**, and came to us from a position as an NMR staff scientist at St. Jude's Children's Research Hospital in Memphis, Tennessee. Matt will be quite busy with our five NMR spectrometers, and has been occupied with getting our new BBFO (broad band fluorine optimized) probe up and running on the 500 MHz spectrometer. Matt has also set up a new NMR facilities website which I would encourage you to visit at

<http://www.uwindsor.ca/nmr>

In October 2008, we hosted the 21<sup>st</sup> annual MOOT NMR Mini-symposium. Thanks to help from my co-chair **Philip Grandinetti** (Ohio State), we were able to attract a large contingent of American participants for the first time in the history of the MOOT. Students, post-docs, faculty, technicians, NMR facility managers and vendors from Ontario, Quebec, Alberta and Nova Scotia were present at the MOOT, along with people from Michigan, Ohio, Indiana, Illinois, Pennsylvania and California, and even a long distance visitor, **Alexey Cherepanov**, from Leiden University in the Netherlands. **Rod Wasylshen** (Alberta), **Glenn Facey** (Ottawa), **Vlad Ladizhansky** (Guelph) and **Giuseppe Melacini** (McMaster) graciously provided us with four outstanding tutorial lectures and accompanying sets of notes for the students, a tradition which I hope

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continues at future MOOT meetings. **Bruce McGarvey** (Windsor) also graced us with a fantastic lecture outlining the historical beginnings of NMR and EPR in North America, which of course he witnessed first hand! The remainder of the presenters were largely students and post-docs, all of whom made excellent oral and poster presentations. There was a very interesting and unexpected twist at this MOOT: due to the faculty strike that was occurring during the time period surrounding the MOOT, we were not allowed to hold any aspect of the conference on campus. We are very grateful to the folks at Canterbury College, who provided us with very nice facilities (including their chapel, all day Saturday) to hold the lectures.

Two of my senior Ph.D. students, **Hiyam Hamaed** and **Aaron Rossini**, were instrumental to the success of the conference, and volunteered many hours of their time to ensure that things ran smoothly. Hiyam seamlessly handled the registrations, program,

poster boards and a number of confusing administrative matters, and Aaron did a fantastic job in arranging all of the hospitality for the conference, including the lunch, coffee breaks, and of course, the banquet. The other members of my group pitched in all weekend to make sure that things went off without a hitch. The banquet is the hallmark of any MOOT, and this one was no exception. The banquet took place on the third floor of the Art Gallery of Windsor, which overlooks the beautiful (!) Detroit skyline. The balconies facing the river were available for people to stroll about in the fall weather, and the third floor galleries were opened up for visitors to check out at their leisure. Just before dinner, one could observe the beautiful sunset behind the Ambassador Bridge, which resulted in a flurry of picture-taking. Chef Anthony Dalupan of Bamboo Restaurant in Windsor provided us with excellent appetizers, dinner and desserts. We are also extremely grateful to **Henry Stronks** and the folks from Bruker who took extra care to make sure everyone enjoyed themselves to the fullest. The only disappointment for me was the unpaid hotel bills for the guests at the newly renovated Chez Schurko...but I supposed I can live with this.

Things have been very busy in the group over the past year. **Joel Tang** finished up his Ph.D. this past fall, and has joined **Alexej Jerschow's** group at NYU as a post-doctoral fellow. His thesis focused on wideline NMR methodologies and applications, and featured the work he did with microcoils (*Chem. Phys. Lett.* **2008**, 466, 227–234) during a trip to France to visit the lab of **Dimitri Sakellariou** (CEA, Saclay). **Luke O'Dell**, who completed his Ph.D. with **Mark E. Smith** at the University of Warwick, joined us as a PDF in February 2008, and has had a very productive period developing and applying WURST-QCPMG pulse sequences for acquisition of ultra-wideline NMR spectra (*Chem. Phys. Lett.* **2008**, 464, 97-102 and **2009**, 468, 330-335). Luke and his wife Marie are enjoying their time in Windsor, and Luke is staying on for another year with our group. **Hiyam Hamaed** published two of her long-term projects, including a  $^{35}\text{Cl}$  NMR study of pharmaceuticals (*J. Am. Chem. Soc.* **2008**, 130, 11056-11065), and a  $^{109}\text{Ag}/^{15}\text{N}$  NMR study of layered silver-amine materials (*Inorg.*

*Chem.* **2008**, 47, 11245–11256). **Aaron Rossini** has just had a *magnum opus* on Chlorine NMR of metallocenes accepted in *J. Am. Chem. Soc.*, and continues to work on metallocene NMR projects.

Some of my former students have made some interesting moves as well: **Ivan Hung**, who finished at Windsor in 2005, spent a few years in Mark Smith's group, and has now moved on to the National High Field Magnetic Laboratory in Tallahassee, FL. **Andy Lo** (Ph.D., 2007) has spent the past year at the University of Stockholm with **Mattias Eden**, and will be moving back to Canada to work with **Dave Bryce** at the University of Ottawa. **Mat Willans**, who worked with me as an undergrad researcher, and recently finished his Ph.D. in Rod Wasylishen's group, has taken up the position of NMR manager at Western.

We are currently involved with some fascinating projects at the highfield NMR facility in Ottawa, and **Victor Terskikh** has become a regular collaborator on interesting NMR and computational projects. I also wish to thank him for allowing me to give you this update from our little corner of the NMR world. Myself, I look forward to spending some time this spring at the Weizmann Institute with **Lucio Frydman**, as well as visiting with friends and colleagues at the upcoming ENC, CSC and Rocky Mountain Conferences. I also look forward to seeing the many interesting developments in the Canadian NMR community in 2009.

Best wishes,  
Rob Schurko



**Front Row** (L-R) Rob Schurko, Marcel Hildebrandt, Joel Tang, Hiyam Hamaed  
**Back Row** (L-R) Bryan Lucier, Luke O'Dell, Aaron Rossini, Alan MacGregor, Mike Laschuk

## Canadian NMR News

Forward us any news of interest to the Canadian NMR community.

Submitted by John Walter (NRC-IMB)

### New Biomolecular Magnetic Resonance Facility for the Atlantic Region

A facility for high resolution biomolecular NMR has been established at the NRC Institute for Marine Biosciences (NRC-IMB), Halifax NS. It contains a new 700 MHz Bruker Avance III™ spectrometer with two cryoprobes and automated sample changing, housed together with an existing Bruker Avance 500 MHz instrument in a newly renovated area having adjoining sample preparation labs and offices.



The capabilities of the new 700 MHz instrument were specified following consultation with prospective users in the Atlantic region, including universities (support through the Atlantic Region Magnetic Resonance Centre, ARMRC, at Dalhousie University), research hospitals, bio-product industries, and government research institutes. They emphasize high sensitivity with a range of sample types, and versatility in automated operation. The 500 MHz instrument has also been provided with a high-resolution  $^1\text{H}/^{13}\text{C}$  MAS probe.

Research projects will cover several broad areas: macromolecules (including membrane-associated proteins and drug-receptor interactions), natural products, nutraceuticals, carbohydrates, functional foods, metabolic profiling of biofluids and tissue extracts, and biomarker discovery. Sensitivity will be optimized for limited sample quantities by a 1.7 mm (40  $\mu\text{L}$ ) cryoprobe, the first and most

sensitive produced for fields > 600 MHz. A 5 mm cryoprobe (600  $\mu\text{L}$ ) will serve samples limited by solubility. Automation will be facilitated by a SampleJet™ sample changer (up to 510 tubes) with optional cooling to 4°C for maintaining sample stability before and after data acquisition, as well as automatic tune and match on all probes. The magnet room is bedrock-based with precise temperature control and low levels of external interference, and initial indications are that noise levels are low. Installation and commissioning of the facility is progressing, although much testing has been completed with encouraging results.

#### Contacts:

Ray Syvitski (NRC-IMB) 902-426-1674

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Mike Lumsden (Dalhousie, ARMRC) 902-494-1635

**Web:** NRC-IMB

<http://imb-ibm.nrc-cnrc.gc.ca/>

Submitted by Alex Bain (McMaster)

### NMR events at CSC 2009

Two NMR symposia and the NMR workshop will be highlights of the CSC meeting in Hamilton this year.



Gillian Goward and Alex Bain, of McMaster University, have organized a symposium on **Materials and Magnetic Resonance**, mainly focused on Solid-State NMR.

[http://www.csc2009.ca/index.cfm/ci\\_id/5376/7.htm#Materials\\_and\\_Magnetic\\_Resonance](http://www.csc2009.ca/index.cfm/ci_id/5376/7.htm#Materials_and_Magnetic_Resonance)

The confirmed invited speakers are:

Sharon Ashbrook (St Andrews, U.K.)

Bruce Balcom (New Brunswick)

Colin Fyfe (UBC)

Hans Spiess (Max Planck Institute for Polymer Research)

Roderick Wasylishen (Alberta)

Giuseppe Melacini, also at McMaster, has put together an excellent program in

**Biomolecular NMR.**

[http://www.csc2009.ca/index.cfm/ci\\_id/5368/2.htm#Biomolecular\\_NMR](http://www.csc2009.ca/index.cfm/ci_id/5368/2.htm#Biomolecular_NMR)

His confirmed speakers are:

Kalle Gehring (McGill)

Mitsu Ikura (Toronto)  
Vladimir Ladizhansky (Guelph)  
Anthony Mittermaier (McGill)  
Ayyalusamy Ramamoorthy (Michigan)  
Simon Sharpe (Toronto)  
Gary Shaw (UWO)  
Leo Spyrapoulos (Alberta)

We are grateful to the National Ultrahigh-Field NMR Facility for Solids, who is also organizing **the Solid-State NMR workshop** (see below), for its support of these events. CSC 2009 promises some excellent science and opportunities for the still-growing NMR community in Canada to get together.

The dates of the meeting are May 30 – June 3, so check the conference website for details of the program. See you in Hamilton!

<http://www.csc2009.ca/>

**Deadline for abstract submission is February 18, 2009. Don't be late!**



#### 4<sup>th</sup> Annual Solid-State NMR Workshop

The National Ultrahigh-Field NMR Facility for Solids and Bruker Canada are pleased to present the 4<sup>th</sup> Annual Solid-State NMR Workshop at the 92<sup>nd</sup> Canadian Chemistry Conference and Exhibition in Hamilton. The workshop will take place on **Saturday afternoon, May 30, 2009**.

This annual Canadian Solid-state NMR event focuses on the latest developments in solid-state NMR spectroscopy with emphasis on practical aspects and applications in materials and life sciences. The workshop will be of interest not only to NMR spectroscopists, but also to students and other researchers interested in using modern NMR techniques in their research practice.

#### Confirmed speakers

Vladimir Michaelis (Manitoba)  
Igor Moudrakovski (NRC-SIMS)  
Aaron Rossini (Windsor)  
Simon Sharpe (SickKids)

Myrna Simpson (Toronto)  
Gang Wu (Queen's)

**Registration** for the NMR Workshop is free but space is limited. To register please forward your name and affiliation to Victor Terskikh.

Email: [terskikhv@nrc-cnrc.gc.ca](mailto:terskikhv@nrc-cnrc.gc.ca)

Note that the NMR Workshop registration is separate and independent from the CSC 2009 conference registration.

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#### Lakeland College invests in NMR equipment

Lakeland College (Lloydminster, Alberta) has purchased an NMR spectrometer among other modern laboratory equipment for its university studies program. The NMR spectrometer will be used to advance learning and training opportunities for first and second-year students taking organic chemistry.

Read the press release by Lakeland College: <http://www.lakelandcollege.ca/news/news01090901.aspx>

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#### New NMR instrument at l'Université de Moncton

**l'Université de Moncton** (Moncton, New Brunswick) has received funding from the Canada Foundation for Innovation (CFI) under the Leaders Opportunity Fund to acquire a new NMR instrument to support research and training at the Department of Chemistry and Biochemistry. Professor Mohamed Touaibia, the principal user of this new spectrometer, will apply NMR to study natural products and their potential medical uses.

**Titre du projet** "Spectromètre RMN pour une meilleure valorisation des produits naturels: de l'isolation à la synthèse à diversité orientée"

Read the press release by l'U de M: [http://www.umoncton.ca/nouvelles/info.php?page=1&id=1752&campus\\_selection=all](http://www.umoncton.ca/nouvelles/info.php?page=1&id=1752&campus_selection=all)

**Web:** Mohamed Touaibia  
<http://www.chimie-biochimie.umoncton.ca/prof/mt/MT.htm>

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#### NMR upgrades at uOttawa (2)

Our colleagues from the University of Ottawa took delivery of a **Bruker AVANCE III 400** NMR spectrometer for solids to complement

the Bruker AVANCE III 200 NMR spectrometer installed there in September 2008. This major hardware acquisition has been made possible thanks to the CFI Leaders Opportunity Fund award to Prof. David Bryce (Chemistry). Dave is excited to explore new opportunities afforded by a double-resonance double-rotation (DOR) probe for the 400 MHz instrument!

In total there are now seven NMR instruments at the University of Ottawa campus (8, including the Bruker AVANCE II 900 at the National NMR Facility for Solids), to keep Glenn and Cheryl very busy for a long time to come.

**Web:** David Bryce  
<http://www.science.uottawa.ca/%7Edbryc159/index.html>

**Web:** uOttawa NMR Facility  
<http://www.science.uottawa.ca/nmr/>

UNIVERSITY OF  
**Waterloo**



### Focus on Waterloo

Fellow NMR spectroscopists at Waterloo have one more reason to celebrate. The proposed Federal Budget 2009 contains an impressive \$50 million item for the Institute for Quantum Computing "to support the construction and establishment of a new world-class research facility".

**Raymond Laflamme**, Director of IQC says, "IQC is proud of its achievements and the recognition both at the international research level and from the government of Canada. \$25M will be put towards the completion of IQC's share of the Quantum-Nano Centre and the other half will be used for overall operations and to attract researchers to IQC. We are determined to be standing at the forefront on the leading edge of research in a field of tremendous potential for the future of Canada. IQC wishes to thank all supporters who have contributed to its success."

Read the press release by IQC:  
[http://www.iqc.ca/institute/news\\_fulltext.php?id=100](http://www.iqc.ca/institute/news_fulltext.php?id=100)

Raymond Laflamme and his colleagues employ NMR spectroscopy among other advanced research tools to develop means to precisely control large multi-spin quantum systems.

They describe some of their approaches in this recent review article in Physical Review A:  
<http://dx.doi.org/10.1103/PhysRevA.78.012328>

As his research profile reads: "**Raymond Laflamme** choreographs the world's most complicated dance: a pirouette of atoms. Using radio-wave pulses, he flips the nuclei of hydrogen and carbon-13 atoms inside a nuclear magnetic resonance machine, causing the nuclei to reverse their positive and negative poles...

<http://www.uwaterloo.ca/profiles/profile.php?id=69>

Inspired by Quantum Computing we also remember about more earthly applications of NMR spectroscopy: Dr. **Bill Power**, professor at the Chemistry Department, uses solid-state NMR in his materials science research projects. A feature interview with **Bill Power** has appeared in the Magazine of the Waterloo Physical Sciences, Issue 1, 2008, pages 12-13.  
<http://www.science.uwaterloo.ca/>

*"No matter what you do, you will have to work hard, and it is easier to work as hard as you need to if you are really interested and excited by that area." - Bill Power*

### Canadian NMR blogs and news sites

Solid-State NMR Literature Blog (Rob Schurko's group, Windsor)  
<http://ssnmr.blogspot.com/>

NMR Facility Blog (Glenn Facey, Ottawa)  
<http://u-of-o-nmr-facility.blogspot.com/>

NMR Facility Blog (Tim Burrow, Toronto)  
<http://www.chem.utoronto.ca/facilities/nmr/NMRBlog/>

NMR Facility News (Albin Otter, Alberta)  
[http://nmr.chem.ualberta.ca/nmr\\_news.htm](http://nmr.chem.ualberta.ca/nmr_news.htm)

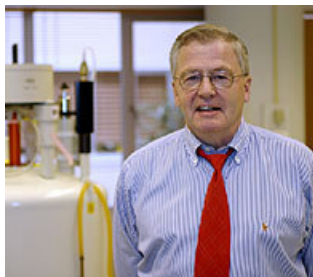
**NMR Theses Recently Defended**  
*Congratulate your students here!*

**Rafal Janik** (Protein NMR Research Group, University of Guelph) October 2008

Research supervisor: Vladimir Ladizhansky

MS thesis: "Development of long-range chemical shift correlation experiments using homonuclear rotary resonance"

## Recognition



**Ian Smith**, Director General of the NRC Institute for Biodiagnostics in Winnipeg, was named an **Officer of the Order of Canada** "for his leadership in the advancement,

development and commercialization of Canada's diagnostic technologies, notably magnetic resonance imaging and its applications in the field of health care."

Dr. Smith was also presented with a 2008 **Outstanding Achievement Award of the Public Service of Canada**. Recognized as the Prime Minister's Award, this is given to "senior public service employees whose careers have been distinguished by a sustained commitment to excellence in the public service and building the public service as a vibrant national institution geared to future needs."

Dr. Smith has been a driving force in the development of MRI technologies and has built the NRC Institute for Biodiagnostics into a world leading research centre for magnetic resonance imaging and spectroscopy.

Press release by NRC Canada:

[http://www.nrc-cnrc.gc.ca/newsroom/news/2009/ibd09-nr\\_e.html](http://www.nrc-cnrc.gc.ca/newsroom/news/2009/ibd09-nr_e.html)

**Web:** NRC-IBD (Photo credit)

<http://ibd.nrc-cnrc.gc.ca/>

**Scott Kroeker** (University of Manitoba) is among several other researchers from the University of Manitoba to share more than \$2.3 million in funding from the Manitoba Government. The funding is provided through the Manitoba Research and Innovation Fund to support research projects related to health, environment and advanced technologies.

Press release by the University of Manitoba:

<http://myuminfo.umanitoba.ca/index.asp?sec=2&too=100&eve=8&dat=1/23/2009&npa=18358>

**Web:** Scott Kroeker

<http://home.cc.umanitoba.ca/%7Ekroekers/index.html>

**André Simpson** (University of Toronto Scarborough) has received the 2008 Environmental Sciences Award jointly offered by the Society of Environmental Toxicology and

Chemistry (SETAC) and the Royal Society of Chemistry. This award recognizes early to mid-career scientists who have accomplished and published outstanding contributions that have advanced the understanding or development of environmental systems, technologies, methodologies or other relevant research in the environmental sciences.

**Web:** André Simpson

<http://www.utoronto.ca/%7Easimpson/>

**Christian Detellier** (University of Ottawa) has been appointed to the position of associate vice-president, research.



Christian does not require a special introduction to the Canadian NMR research community. He was instrumental in establishing the National Ultrahigh-Field NMR Facility for Solids in Ottawa. Most recently Christian served as a Chair of the Chemical Institute of Canada and was an interim director of the Centre for Catalysis Research and Innovation at the University of Ottawa.

[http://www.gazette.uottawa.ca/article\\_e\\_1967.html](http://www.gazette.uottawa.ca/article_e_1967.html)

*We wish Christian the best in his new position in these challenging economic times!*

Photo from : <http://www.gazette.uottawa.ca/>

## On the move

**Dinu Iuga**, former Manager of the University of Lethbridge 500 MHz NMR Facility, has moved to England, where he will manage the new U.K. 850 MHz Solid-State NMR Facility at the University of Warwick. We join our colleagues from Lethbridge in wishing Dinu all the best in his new position.

**Matt Revington** has settled in as the new manager of the NMR Facility at the University of Windsor. Matt received his PhD in Biochemistry from the University of Western Ontario, and was a postdoctoral fellow at the University of Michigan and UWO. Before moving to Windsor, Matt was an NMR Staff Scientist at St Jude Children's Research Hospital in Memphis, Tennessee.

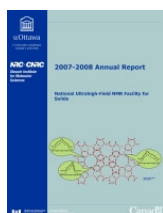
## the 900 NMR Facility News

### New International Advisory Board

The National Ultrahigh-Field NMR Facility for Solids wishes to extend its sincere thanks to the outgoing members of our International Advisory Board (IAB) serving over the period 2005-2008. Over the past three years, **Prof. Jean-Paul Amoureux** (Lille, France), **Dr. Paul Ellis** (PNL, USA), and **Prof. Mark Smith** (Warwick, UK) have provided the Steering Committee with invaluable input and advice on facility operations and helped keep us abreast of new opportunities.

The Facility is proud to announce that Dr. Mona Nemer, the Vice-President (Research) of the University of Ottawa, and Dr. Pierre Coulombe, the President of the National Research Council Canada, have jointly appointed **Prof. Timothy Cross** (Florida, USA), **Prof. Arno Kentgens** (Nijmegen, The Netherlands), and **Prof. Marek Pruski** (Iowa, USA) to serve on the IAB for the next three years. We look forward to the suggestions and recommendations of these highly distinguished NMR experts to keep the Facility at the forefront of solid-state NMR research.

[http://nmr900.ca/board\\_e.html](http://nmr900.ca/board_e.html)



### 2007-2008 Annual Report

The 2007-2008 Annual Report for the National Ultrahigh-Field NMR Facility for Solids is now available in print and for download at [http://nmr900.ca/annual\\_e.html](http://nmr900.ca/annual_e.html)

If you have not received a printed copy of this report and would like to receive one, please forward your mailing address to the Facility manager.

### Travel support program for students and young scientists

Students and young scientists from Canadian Universities are welcome to apply for a travel stipend towards full or partial reimbursement of their travel expenses incurred while visiting the 900 Facility. All requests should be submitted by a supervisor in advance of the trip and include a cost estimate. Requests

should be forwarded to the Facility manager for review and approval by the Steering Committee.

[http://nmr900.ca/policies\\_e.html](http://nmr900.ca/policies_e.html)

*Recent Travel Grant Recipient*

**Kamal H. Mroue** (University of Waterloo)

### Upcoming NMR Events

*Let everyone know about upcoming NMR-related events at your University or Lab. NMR conference announcements are also welcome.*

### Frontiers of NMR in Biology Keystone Symposium

February 15-20, 2009, Santa Fe, New Mexico  
<http://www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=1012>

### Biophysical Society 53<sup>rd</sup> Annual Meeting

February 28 - March 4, 2009, Boston, MA  
<http://www.biophysics.org/2009meeting/Home/tabid/390/Default.aspx>

**Special Event** Biophysical Society of Canada Mixer, Sunday, March 1, 6:00 PM - 7:00 PM

### 50<sup>th</sup> ENC

March 29 - April 3, 2009, Asilomar, Pacific Grove, California  
<http://www.enc-conference.org/>

*Post deadline abstracts may be entered until February 13, 2009*

### NMR events at CSC 2009

Three NMR meetings are scheduled for **CSC 2009** Conference in Hamilton, ON, May 30 - June 3, 2009

**Solid-State NMR Workshop** on May 30, organized by the 900 NMR Facility  
[http://nmr900.ca/events\\_e.html](http://nmr900.ca/events_e.html)

**Biomolecular NMR** Symposium organized by Giuseppe Melacini, McMaster  
[http://www.csc2009.ca/index.cfm/ci\\_id/5368/2.htm#Biomolecular\\_NMR](http://www.csc2009.ca/index.cfm/ci_id/5368/2.htm#Biomolecular_NMR)

**Materials and Magnetic Resonance** Symposium organized by Gillian Goward and Alex Bain, McMaster  
[http://www.csc2009.ca/index.cfm/ci\\_id/5376/7.htm#Materials\\_and\\_Magnetic\\_Resonance](http://www.csc2009.ca/index.cfm/ci_id/5376/7.htm#Materials_and_Magnetic_Resonance)

**Deadline for abstract submission is February 18, 2009. Don't be late!**  
<http://www.csc2009.ca/>

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**XeMat 2009** the 4<sup>th</sup> International Symposium on Xenon NMR of Materials

June 8-10, 2009, Ruka Fell, Kuusamo, Finland  
<http://cc.oulu.fi/~nmrlab/xemat/>

### **XXXI Finnish NMR Symposium**

June 10-12, 2009, Ruka Fell, Kuusamo, Finland  
<http://cc.oulu.fi/~nmrlab/NMRsymposium/>

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**VIVA III** the 3<sup>rd</sup> Annual West Coast NMR Minisymposium

June 2009, Simon Fraser University, Vancouver, B.C.  
<http://www.sfu.ca/chemistry/facilities/nmr/index.html>

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### **EUROMAR-2009**

July 5-9, 2009, Göteborg, Sweden  
<http://www.euromar2009.com>

*Call for nominations, deadline Feb 15, 2009*

### **Russell Varian Prize 2009**

<http://www.euromar2009.com/prize.html#russell>

### **Raymond Andrew Prize 2009**

<http://www.euromar2009.com/prize.html#raymond>

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### **51<sup>st</sup> Annual Rocky Mountain Conference on Analytical Chemistry**

July 19-23, 2009, Snowmass, Colorado  
<http://www.rockychem.com/>

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**ICASS 2009** 55<sup>th</sup> International Conference on Analytical Sciences and Spectroscopy

August 9-12, 2009, Kingston, Ontario  
<http://www.icass.ca/>

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**SCM 09** 11<sup>th</sup> International Spin Chemistry Meeting

August 9-11, 2009, St. Catharines, Ontario  
<http://www.brocku.ca/scm09>

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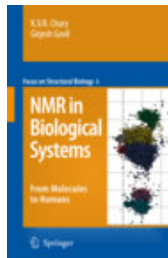
### **MOOT 22 NMR Symposium**

October, 2009, Ottawa, ON  
<http://www.mootnmr.org>

## **NMR Books**

*Disclaimer: For your information only. In this bulletin we are not endorsing any products or services.*

### **NMR in Biological Systems: From Molecules to Human**



K.V.R. Chary, Girjesh Govil  
**Hardcover:** 530 pages  
**Publisher:** Springer; 1<sup>st</sup> edition (May 8, 2008)  
**Language:** English  
**ISBN-10:** 1402066791  
**ISBN-13:** 978-1402066795

**Authors:** During teaching NMR to students and researchers, we felt the need for a text-book which can cover modern trends in the application of NMR to biological systems. This book caters to the needs of: (i) graduate students who mostly learn such techniques from senior post-docs in the laboratory; (ii) those who are not experts in NMR but wish to understand if a particular problem in animal, plant, medical and pharmaceutical sciences can be answered by NMR; and (iii) those who are experts in chemistry and biochemistry and wish to know how NMR can provide them information on structural or functional aspect of proteins, nucleic acids, cells and tissues, human and plant organs and other biological materials. This book builds a means of knowledge transfer between the beginners and the experts in NMR as applied to all aspects of life sciences.

<http://www.amazon.com/gp/product/1402066791/>

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### **Encyclopedia of Magnetic Resonance: NMR Crystallography**



**John Wiley & Sons** is in the process of creating an ultimate online Magnetic Resonance knowledge resource. Based on the Encyclopedia of Nuclear Magnetic Resonance printed in 1996 (volumes 1-8) and in 2002 (volume 9) this online encyclopedia is currently undergoing major revision and expansion, boldly aiming at becoming the most comprehensive and up-to-date resource on Magnetic Resonance.



Charged with this challenging task are two current Editors-in-Chief, Canada's own **Roderick Wasylishen** (University of Alberta) and **Robin Harris** from the U.K.

to browse the list of topics:

<http://www.mrw.interscience.wiley.com/emrw/9780470034590/emr/topics>

The most recently updated topic is on the emerging field of "**NMR Crystallography**". NMR Crystallography incorporates solid-state NMR data into the crystal structure determination process in a variety of materials. This approach becomes particularly important for materials that are difficult to grow as single crystals suitable for single-crystal X-ray diffraction.

**Canadian NMR research** in this area is represented by four excellent review articles:

**Josef W. Zwanziger**, "Geometric Phases"  
<http://dx.doi.org/10.1002/9780470034590.emrstm0189>

**Darren H. Brouwer**, "Interplay between Solid-State NMR and Single-Crystal X-Ray Diffraction"  
<http://dx.doi.org/10.1002/9780470034590.emrstm1041>

**Serge Lacelle**, "Multiple Quantum Coherences in Extended Dipolar Coupled Spin Networks"  
<http://dx.doi.org/10.1002/9780470034590.emrstm0332>

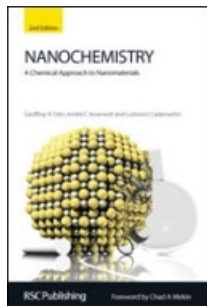
**David L. Bryce**, "Tensor Interplay"  
<http://dx.doi.org/10.1002/9780470034590.emrstm1039>

A copy of the printed edition of the **Encyclopedia of Nuclear Magnetic Resonance** (1996, 2002) is available to visitors of the 900 NMR Facility.



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## Nanochemistry: A Chemical Approach to Nanomaterials



**Authors** Geoffrey A. Ozin, Andre C. Arsenault and Ludovico Cademartiri  
**Hardcover:** 770 pages  
**Publisher:** Royal Society of Chemistry; 2nd Revised edition (January 2009)  
**Language:** English  
**ISBN-10:** 184755895X  
**ISBN-13:** 978-1847558954

**RSC:** "... The global success of the 1st edition of "Nanochemistry", and exceptionally rapid change in the field, has necessitated the publication of a 2nd edition after only three years. This truly major update highlights the latest breakthroughs using over 80 new case histories, more problem sets, and more teaching principles. Written for teachers and students, the book catapults the reader to the forefront of the field. Using simple language, and focusing on the concepts, it covers all chemistry techniques commonly used to synthesize nanomaterials. In this book, case histories enable readers to 'connect the dots' and understand the possibilities ahead whilst problem sets encourage students to think creatively and laterally about what they have learnt. The extensive bibliography will satisfy those hungry for more detail."

<http://www.amazon.com/gp/product/184755895X/>

**Web:** Geoffrey Ozin (University of Toronto)  
<http://www.chem.utoronto.ca/staff/GAO/>

*Perhaps not "an NMR book" per se, but no doubt this latest work by our colleagues from the University of Toronto will be of significant interest for many reading this bulletin.*

## NMR Jobs and Vacancies

*You are welcome to post here your vacancies, openings, and related announcements. We can also post short "job wanted" requests.*

### University of Lethbridge

**NMR Facility Manager:** The Faculty of Arts and Science at the University of Lethbridge is searching for an individual to manage the NMR Facility. The appointment will be held in the Department of Chemistry and Biochemistry and will start on or before July 1st, 2009. The appointment will be to an academic position, classified as Academic Assistant. The position is open until filled, but files will be evaluated commencing **March 1<sup>st</sup>, 2009**.

For more information:

[http://www.uleth.ca/hum/Services/career\\_fac/Chemistry\\_Biochemistry\\_January\\_2009.htm](http://www.uleth.ca/hum/Services/career_fac/Chemistry_Biochemistry_January_2009.htm)

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### Environmental Molecular Sciences Laboratory, PNNL

**Two Magnetic Resonance Scientist positions:** The Environmental Molecular

Sciences Laboratory (EMSL), a DOE User Facility administered by Pacific Northwest National Laboratory (PNNL), has immediate positions available for two exceptional candidates in the area of magnetic resonance spectroscopy (either NMR or EPR). One position represents a senior hire while the other position is a mid- to entry-level position. Both candidates must establish a preeminent research operation that engages the user community and takes advantage of the novel infrastructure present within the EMSL. The closing date for this search is **April 10<sup>th</sup> 2009**.

For more information and to apply proceed to <http://jobs.pnl.gov>

and enter the search finder for positions **116586** (the senior position) or **116587** (the mid- to entry-level position).

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### University of British Columbia

Postdoctoral and Graduate Student Positions in Biological NMR are available immediately at the University of British Columbia (Vancouver, Canada) to study (i) the regulation of eukaryotic gene expression by post-translational modifications of the ETS transcription factor family; and (ii) the electrostatic and dynamic basis of catalysis by enzymes involved in the synthesis and degradation of carbohydrates. Representative publications on these areas of research can be found at:  
<http://otter.biochem.ubc.ca/publications.html>

Our group is equipped with dedicated 500 and cryoprobe 600 MHz NMR spectrometers, off-line computing, and a full wet laboratory for the production and biophysical characterization of proteins involved in the above projects.

Postdoctoral candidates should have a publication record in NMR spectroscopy, as well as basic laboratory techniques including basic molecular biology and protein biochemistry. Salaries are in accordance with the Canadian Institutes of Health Research postdoctoral and graduate student stipends.

The Departments of Chemistry and Biochemistry & Molecular Biology at the University of British Columbia provide an exciting environment for research in structural biology. In addition, the Vancouver area offers

endless possibilities for outdoor ocean and mountain activities.

Interested candidates should email a cover letter, CV, and the names (plus email addresses) of 2-3 referees to:

**Lawrence McIntosh**  
[mcintosh@chem.ubc.ca](mailto:mcintosh@chem.ubc.ca)

Departments of Biochemistry and Chemistry  
Life Sciences Centre  
2350 Health Sciences Mall  
University of British Columbia  
Vancouver BC Canada V6T 1Z3

**web:** <http://otter.biochem.ubc.ca/index.html>

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### Listings of NMR jobs and vacancies

Canadian NMR Jobs  
[http://nmr900.ca/ssnmr\\_jobs.html](http://nmr900.ca/ssnmr_jobs.html)

NMR jobs on the NMR Information Server  
<http://www.spincore.com/nmrjobs/>

List of NMR jobs and Post-Doc positions maintained by Dror Warschawski  
<https://listes.sc.univ-paris-diderot.fr/sympa/info/nmr>

NMR jobs on SpectroscopyNow.com  
<http://www.spectroscopynow.com/coi/cda/list.cda?type=Job&chld=0>

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### Canadian NMR Research Highlights

*Research highlights and most recent NMR publications by Canadian research teams.*

### International NMR-Metabolomics Exercise

**John Walter** and colleagues from the NRC Institute for Marine Biosciences (NRC-IMB, Halifax, Nova Scotia) took part in a multinational project aimed to study comparability and precision of NMR results independently obtained by different NMR labs. Seven labs in four countries, U.S.A., Canada, U.K., and Australia, analyzed the same set of samples related to environmental metabolomics. Data obtained by each laboratory was then subjected to statistical analysis to evaluate reliability of NMR in environmental studies. To learn more about this important project:

**M.R. Viant, D.W. Bearden, J.G. Bundy, I.W. Burton, T.W. Collette, D.R. Ekman, V. Ezernieks, T.K. Karakach, C.Y. Lin, S.**

**Rochfort, J.S. De Ropp, Q. Teng, R.S. Tjeerdema, J.A. Walter, H. Wu,** "International NMR-Based Environmental Metabolomics Intercomparison Exercise," *Environmental Science & Technology* **43** (2009) 219–225.  
<http://dx.doi.org/10.1021/es802198z>

**Web:** John Walter, NRC-IMB  
[http://www.imb.nrc.ca/programs/nmr/index\\_e.php](http://www.imb.nrc.ca/programs/nmr/index_e.php)

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### **Climate warming and soils: NMR paper in *Nature Geoscience***

A research team from the University of Toronto Scarborough led by Myrna Simpson reports an accelerated rate of decomposition of some soil organics and accumulation of others due to soil warming.

**X. Feng, A.J. Simpson, K.P. Wilson, D.D. Williams and M.J. Simpson,** "Increased cuticular carbon sequestration and lignin oxidation in response to soil warming," *Nature Geoscience* **1** (2008) 836–839.  
<http://dx.doi.org/10.1038/ngeo361>

This paper has generated considerable media attention including a feature interview "Soil Alert" with Myrna on *Daily Planet* (aired on November 27, 2008).

**Web:** Myrna Simpson (UTSC)  
<http://www.utsc.utoronto.ca/%7Emsimpson/>



**B.A. Demko, R.E. Wasylshen,** "Solid-State Selenium-77 NMR," *Progress in Nuclear Magnetic Resonance Spectroscopy* (2009) online. (invited review)  
<http://dx.doi.org/10.1016/j.pnmrs.2008.10.002>

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### **Two NMR papers in PNAS**

**T. Mittag, S. Orlicky, W.Y. Choy, X.J. Tang, H. Lin, F. Sicheri, L.E. Kay, M. Tyers, J.D. Forman-Kay,** "Dynamic equilibrium engagement of a polyvalent ligand with a single-site receptor," *Proc. Natl. Acad. Sci. USA* **105** (2008) 17772–17777.  
<http://dx.doi.org/10.1073/pnas.0809222105>

**P. Di Lello, L.M.M. Jenkins, C. Mas, C. Langlois, E. Malitskaya, A. Fradet-**

**Turcotte, J. Archambault, P. Legault, J.G. Omichinski,** "P53 and TFIIE alpha share a common binding site on the Tfb1/p62 subunit of TFIIF," *Proc. Natl. Acad. Sci. USA* **105** (2008) 106–111.  
<http://dx.doi.org/10.1073/pnas.0707892105>

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### **Nature**

**T. Moldoveanu, K. Gehring, D.R. Green,** "Concerted multi-pronged attack by calpastatin to occlude the catalytic cleft of heterodimeric calpains," *Nature* **456** (2008) 404–408.  
<http://dx.doi.org/10.1038/nature07353>

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### **Nature Structural & Molecular Biology**

**Y. Sheng, R.C. Laister, A. Lemak, B. Wu, E. Tai, S.L. Duan, J. Lukin, M. Sunnerhagen, S. Srisailam, M. Karra, S. Benchimol, C.H. Arrowsmith,** "Molecular basis of Pirh2-mediated p53 ubiquitylation," *Nature Structural & Molecular Biology* **15** (2008) 1334–1342.  
<http://dx.doi.org/10.1038/nsmb.1521>

**Z. Zhou, H.Q. Feng, D.F. Hansen, H. Kato, E. Luk, D.I. Freedberg, L.E. Kay, C. Wu, Y.W. Bai,** "NMR structure of chaperone Chz1 complexed with histones H2A.Z-H2B," *Nature Structural & Molecular Biology* **15** (2008) 868–869.  
<http://dx.doi.org/10.1038/nsmb.1465>

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### **Coordination Chemistry Reviews special issue, volume 252 (21–22) 2008 "Applications of NMR to Inorganic and Organometallic Chemistry"**

Featuring

**R.H. Morris** "Dihydrogen, dihydride and in between: NMR and structural properties of iron group complexes," *Coordination Chemistry Reviews* **252** (2008) 2381–2394.  
<http://dx.doi.org/10.1016/j.ccr.2008.01.010>

In this review **Robert Morris** (University of Toronto) tabulates structures and NMR properties of almost 200 iron, ruthenium and osmium complexes containing dihydrogen, and presents a variety of interesting trends based on the H-H bond length.

**Web:** Robert Morris  
<http://www.chem.utoronto.ca/~rmorris/>

## Recent NMR Publications

We are listing here most recent NMR publications by Canadian research groups as they appear on the [www.nmr900.ca](http://www.nmr900.ca) website. Although we are doing our best keeping track of your publications, this list should not be considered complete. You are encouraged to let us know of your recent publications as they become available.

### Memorial University of Newfoundland

**S. Bourbigot, E. Dodd, C. Horwood, N. Cumby, L. Fardy, W.H. Welch, Z. Ramjan, S. Sharma, A.J. Waring, M.R. Yeaman, V. Booth**, "Antimicrobial peptide RP-1 structure and interactions with anionic versus zwitterionic micelles," *Biopolymers* **91** (2009) 1-13.  
<http://dx.doi.org/10.1002/bip.21071>

### Dalhousie University

**M.A. Rankin, D.F. Maclean, R. McDonald, M.J. Ferguson, M.D. Lumsden, M. Stradiotto**, "Probing the Dynamics and Reactivity of a Stereochemically Nonrigid Cp\*Ru(H)(kappa<sup>2</sup>-P,Carbene) Complex," *Organometallics* **28** (2009) 74-83.  
<http://dx.doi.org/10.1021/om800761c>

**A. Bajaj, A. Khanna, B. Chen, J.G. Longstaffe, U. Werner-Zwanziger, J.W. Zwanziger, Y. Gómez, F. González**, "Structural investigation of bismuth borate glasses and crystalline phases," *Journal of Non-Crystalline Solids* **355** (2009) 45-53.  
<http://dx.doi.org/10.1016/j.jnoncrysol.2008.09.033>

### NRC-IMB

**J.S. Craigie, S.L. MacKinnon, J.A. Walter**, "Liquid seaweed extracts identified using <sup>1</sup>H NMR profiles," *J. Appl. Phycol.* **20** (2008) 665-671.  
<http://dx.doi.org/10.1007/s10811-007-9232-1>

**M.R. Viant, D.W. Bearden, J.G. Bundy, I.W. Burton, T.W. Collette, D.R. Ekman, V. Ezernieks, T.K. Karakach, C.Y. Lin, S. Rochfort, J.S. De Ropp, Q. Teng, R.S. Tjeerdema, J.A. Walter, H. Wu**, "International NMR-Based Environmental Metabolomics Intercomparison Exercise,"

*Environmental Science & Technology* **43** (2009) 219-225.  
<http://dx.doi.org/10.1021/es802198z>

### University of New Brunswick

**L. Li, Q. Chen, A.E. Marble, L. Romero-Zerón, B. Newling, B.J. Balcom**, "Flow Imaging of Fluids in Porous Media by Magnetization Prepared Centric-scan SPRITE," *Journal of Magnetic Resonance* (2009) online.  
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**C. Coarna, B. Newling**, "Short, Shaped Pulses in a Large Magnetic Field Gradient," *Journal of Magnetic Resonance* **196** (2009) 127-132.  
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### Université Laval

**J.-F. Labbé, F. Cronier, R.C. Gaudreault, M. Auger**, "Spectroscopic characterization of DMPC/DOTAP cationic liposomes and their interactions with DNA and drugs," *Chemistry and Physics of Lipids* (2009) accepted.  
<http://dx.doi.org/10.1016/j.chemphyslip.2009.01.002>

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<http://dx.doi.org/10.1002/macp.200800365>

### Université de Montréal

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**C. Langlois, C. Mas, P. Di Lello, L.M.M. Jenkins, P. Legault, J.G. Omichinski**, "NMR structure of the complex between the Tfb1 subunit of TFIIH and the activation domain of VP16: Structural similarities between VP16 and

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<http://dx.doi.org/10.1261/rna.824308>

**P. Di Lello, L.M.M. Jenkins, C. Mas, C. Langlois, E. Malitskaya, A. Fradet-Turcotte, J. Archambault, P. Legault, J.G. Omichinski**, "P53 and TFIIE alpha share a common binding site on the Tfb1/p62 subunit of TFIIF", *Proc. Natl. Acad. Sci. USA* **105** (2008) 106-111.  
<http://dx.doi.org/10.1073/pnas.0707892105>

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#### McGill University

**B. Fortier-McGill and L. Reven**, "<sup>2</sup>H NMR Studies of Polymer Multilayer Capsules, Films, and Complexes," *Macromolecules* **42** (2009) 247-254.  
<http://dx.doi.org/10.1021/ma801929g>

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#### University of Ottawa

**T.A. Elboki, C. Detellier**, "Kaolinite-poly(methacrylamide) intercalated nanocomposite via in situ polymerization," *Canadian Journal of Chemistry* **87** (2009) 272-279.  
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**C.M. Widdifield, R.P. Chapman, D.L. Bryce**, "Chlorine, Bromine, and Iodine Solid-State NMR Spectroscopy," *Annual Reports on NMR Spectroscopy* **66** (2009) 195-325.

**S. Letaief, T. Diaco, W. Pell, S.I. Gorelsky, C. Detellier**, "Ionic Conductivity of Nanostructured Hybrid Materials Designed from Imidazolium Ionic Liquids and Kaolinite," *Chemistry of Materials* **20** (2008) 7136-7142.  
<http://dx.doi.org/10.1021/cm800758c>

**D.L. Bryce** "Tensor Interplay", *Encyclopedia of Magnetic Resonance*, Wiley (2008).  
<http://dx.doi.org/10.1002/9780470034590.emrstm1039>

**S. Letaief, I.K. Tonle, T. Diaco, C. Detellier**, "Nanohybrid materials from interlayer functionalization of kaolinite. Application to the electrochemical preconcentration of cyanide," *Applied Clay Science* **42** (2008) 95-101.  
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#### NRC-IBS


**E. Vinogradov, C. Wilde, E.M. Anderson, A. Nakhamchik, J.S. Lam, D.A. Rowe-Magnus**, "Structure of the lipopolysaccharide core of *Vibrio vulnificus* type strain 27562," *Carbohydrate Research* (2009) online.  
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**R.S. Houlston, B.C. Jacobs, A.P. Tio-Gillen, J.J. Verschuuren, N.H. Khieu, M. Gilbert, and H.C. Jarrell**, "STD-NMR Used To Elucidate the Fine Binding Specificity of Pathogenic Anti-Ganglioside Antibodies Directly in Patient Serum," *Biochemistry* **48** (2009) 220-222.  
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**S. Cadars, D.H. Brouwer and B.F. Chmelka**, "Probing local structures of siliceous zeolite frameworks by solid-state NMR and first-principles calculations of <sup>29</sup>Si-O-<sup>29</sup>Si scalar couplings," *Phys. Chem. Chem. Phys.* **11** (2009) online.  
<http://dx.doi.org/10.1039/b815361b>


 **V.V. Terskikh, S.J. Lang, P.G. Gordon, G.D. Enright, and J.A. Ripmeester**, "<sup>13</sup>C CP MAS NMR of Halogenated (Cl, Br, I) Pharmaceuticals at Ultrahigh Magnetic Fields," *Magnetic Resonance in Chemistry* (2009) online.  
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 **A. Sutrisno, V.V. Terskikh and Y. Huang**, "A natural abundance <sup>33</sup>S solid-state NMR study of layered transition metal disulfides at ultrahigh magnetic field," *Chem. Commun.* (2008) 186-188.  
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**D. Bardelang, M.B. Zaman, I.L. Moudrakovski, S. Pawsey, J.C. Margeson, D. Wang, X. Wu, J.A. Ripmeester, C.I. Ratcliffe, K. Yu**, "Interfacing Supramolecular Gels and Quantum Dots with Ultrasound: Smart Photoluminescent Dipeptide Gels," *Advanced Materials* **20** (2008) 4517-4520.  
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<http://dx.doi.org/10.1021/jp808524h>

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 **F. Chen, G. Ma, R.G. Cavell, V.V. Terskikh, and R.E. Wasylshen**, "Solid-State <sup>115</sup>In NMR Study of Indium Coordination Complexes," *Chem. Commun.* (2008) 5933-5935.  
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### Queen's University

**G. Wu and I. Kwan**, "The helical structure of disodium guanosine 5'-monophosphate self-assembly in neutral solution," *Journal of the American Chemical Society* **131** (2009) ASAP.  
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**S. Martic, G. Wu, and S. Wang**, "N2-Functionalized Blue Luminescent Guanosines by 2,2'-Dipyridylamino and 2-(2'-Pyridyl)benzimidazolyl Chelate Groups and Their Interactions with Zn(II) Ions," *Inorganic Chemistry* **47** (2008) 8315-8323.  
<http://dx.doi.org/10.1021/ic800899b>

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**P. Lundström, D.F. Hansen, P. Vallurupalli and L.E. Kay**, "Accurate Measurement of Alpha Proton Chemical Shifts of Excited Protein

States by Relaxation Dispersion NMR Spectroscopy," *Journal of the American Chemical Society* **131** (2009) ASAP.  
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**Y. Sheng, R.C. Laister, A. Lemak, B. Wu, E. Tai, S.L. Duan, J. Lukin, M. Sunnerhagen, S. Srisailam, M. Karra, S. Benchimol, C.H. Arrowsmith**, "Molecular basis of Pirh2-mediated p53 ubiquitylation," *Nature Structural & Molecular Biology* **15** (2008) 1334-1342.  
<http://dx.doi.org/10.1038/nsmb.1521>

**T. Mittag, S. Orlicky, W.Y. Choy, X.J. Tang, H. Lin, F. Sicheri, L.E. Kay, M. Tyers, J.D. Forman-Kay**, "Dynamic equilibrium engagement of a polyvalent ligand with a single-site receptor," *Proc. Natl. Acad. Sci. USA* **105** (2008) 17772-17777.  
<http://dx.doi.org/10.1073/pnas.0809222105>

**D.M. Korzhnev, I. Bezsonova, S. Lee, T.V. Chalikian, L.E. Kay**, "Alternate Binding Modes for a Ubiquitin/SH3 Domain Interaction Studied by NMR Spectroscopy," *Journal of Molecular Biology* (2008) accepted.  
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**D.Y.L. Mao, D. Neculai, M. Downey, S. Orlicky, Y.Z. Haffani, D.F. Ceccarelli, J.S.L. Ho, R. K. Szilard, W. Zhang, C.S. Ho, L. Wan, C. Fares, S. Rumpel, I. Kurinov, C.H. Arrowsmith, D. Durocher, F. Sicheri**, "Atomic Structure of the KEOPS Complex: An Ancient Protein Kinase-Containing Molecular Machine," *Molecular Cell* **32** (2008) 259-275.  
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**M.J. Plevin, I. Hayashi, M. Ikura**, "Characterization of a Conserved "Threonine Clasp" in CAP-Gly Domains: Role of a Functionally Critical OH/pi Interaction in

Protein Recognition," *Journal of the American Chemical Society* **130** (2008) 14918-14919.  
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**P.B. Stathopoulos, L. Zheng, G.Y. Li, M.J. Plevin, M. Ikura,** "Structural and mechanistic insights into STIM1-mediated initiation of store-operated calcium entry," *Cell* **135** (2008) 110-122.  
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### McMaster University

**C.K. Anand, A.D. Bain, A. Sharma,** "Optimized Sampling Patterns for Multidimensional T<sub>2</sub> Experiments," *Journal of Magnetic Resonance* (2009) accepted.  
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### University of Guelph

**L. Shi, M.A.M. Ahmed, W. Zhang, G. Whited, L.S. Brown, V. Ladizhansky,** "Three-dimensional solid-state NMR study of a seven-helical integral membrane proton pump – structural insights," *Journal of Molecular Biology* (2009) accepted.  
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**G. Harauz, V. Ladizhansky,** "Structure and dynamics of the myelin basic protein (MBP) family by solution and solid-state NMR". Chapter X (pp 196-231) in Joan M. Boggs (editor), "Myelin Basic Protein", Series on "Intrinsically Disordered Proteins" (edited by V. Uversky). Nova Science Publishers, 2008.

**M.A.M. Ahmed, V.V. Bamm, L. Shi, M. Steiner-Mosonyi, J.F. Dawson, L. Brown, G. Harauz, V. Ladizhansky,** "Induced Secondary Structure and Polymorphism in an Intrinsically Disordered Structural Linker of the CNS: Solid-State NMR and FTIR Spectroscopy of Myelin Basic Protein Bound to Actin," *Biophysical Journal* **96** (2009) 180-191.  
<http://dx.doi.org/10.1016/j.bpj.2008.10.003>

**T. Hasiuk, K.R. Jeffrey,** "<sup>6</sup>Li NMR in lithium borate glasses," *Solid State Nuclear Magnetic Resonance* **34** (2008) 228-239.  
<http://dx.doi.org/10.1016/j.ssnmr.2008.09.003>

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**C.A. Ryan, C. Negrevergne, M. Laforest, E. Knill, R. Laflamme,** "Liquid-state nuclear


magnetic resonance as a testbed for developing quantum control methods," *Physical Review A* **78** (2008) 012328(1-14).  
<http://dx.doi.org/10.1103/PhysRevA.78.012328>

**C.A. Ryan, O. Moussa, J. Baugh, R. Laflamme,** "Spin based heat engine: Demonstration of multiple rounds of algorithmic cooling," *Physical Review Letters* **100** (2008) 140501(1-4).  
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